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BOTANY.—Alfaroa, *a new genus of trees of the family Juglandaceae from Costa Rica.* PAUL C. STANDLEY, U. S. National Museum.[1]

In 1924 the writer found in flower in the mountains south of Cartago, Costa Rica, a tree which at the time of collection was supposed to be *Oreomunnea pterocarpa* Oerst., one of the least-known and most remarkable trees of Central America. That tree has had a curious history, and is of interest because of the fact that it has been referred by some botanists to the genus *Engelhardtia*, a group known otherwise from the East Indies.

Later Mr. C. H. Lankester forwarded specimens of the same tree collected at Juan Viñas, in the same general region. Comparison of them with authentic material of *Oreomunnea* proved that they represented a different species. These new specimens were just past the flowering state, and the bracts very small, but it was supposed that they might in age develop into the large hand-shaped bracts that distinguish *Oreomunnea*. The Juan Viñas specimens were given a provisional name as a new species of *Oreomunnea*, but fortunately it was decided to delay publication until more material had been collected. This I was able to do during the present year, when in early March a second visit was made, in company with Prof. Rubén Torres Rojas, to El Muñeco, perhaps the richest locality botanically that I have ever seen. We were fortunate in finding the trees in young fruit. The fruits proved to be a great surprise, for they were not at all like those of *Oreomunnea*, but rather miniature walnuts.

Aside from the superficial aspect of the fruit, the tree did not resemble very closely a walnut tree. Study of the ample series of material now at hand indicates that this Costa Rican tree is best treated as the type of a new genus, which is described here.

[1] Published with permission of the Secretary of the Smithsonian Institution. Received Dec. 3, 1926.

Alfaroa Standl., gen. nov.

Tree; leaves mostly opposite, estipulate, pinnate, with no truly terminal leaflet, the leaflets numerous, mostly alternate but sometimes opposite, membranaceous, serrate or entire, glandular-punctate beneath; flowers monoecious, spicate, the spikes terminal, the pistillate flowers numerous, inserted singly, sessile, the staminate flowers few, solitary and sessile at the base of the spike or few and arranged upon two short basal branches; bracts of the staminate flowers linear-subulate, shorter than the calyx and free from it; calyx irregularly 4–5-lobed, the lobes oblong, obtuse; stamens about 9, inserted in a single series about the ovoid rudiment of the ovary, the filaments nearly obsolete, the anthers 2-celled, dehiscent by longitudinal slits; pistillate flowers subtended by a minute 3-lobed free bract shorter than the ovary; perianth deeply 4-lobed, the lobes oblong-linear, unequal, obtuse, erect, persistent upon the apex of the fruit; style shorter than the perianth lobes, bifurcate, the stigmas subglobose, verrucose; fruit oval or obovoid, small, the pericarp nearly dry, thin, indehiscent, adhering closely to the endocarp; nut thin-walled, smooth, falsely 4-celled, the partitions nearly complete; seeds 4-lobed to the base.

The genus is named in honor of Anastasio Alfaro, Director of the National Museum of Costa Rica, who is remembered with affectionate regard by all scientists who have visited Costa Rica for many years past. His enthusiasm, with regard to all matters relating to natural history has done much to stimulate in others an interest in these subjects. In botany his chief interests have been the ferns and orchids, and in the latter, especially, he has made notable discoveries. To the National Herbarium he has contributed an extensive series of beautifully prepared specimens of orchids, representing many species of this family of plants, in which Costa Rica is supreme among American countries. To Don Anastasio the writer is indebted personally for many courtesies extended during two visits to Costa Rica.

Alfaroa costaricensis Standl., sp. nov.

Tree 5–12 m. high or larger, the small crown composed of few spreading branches; bark nearly smooth, pale brownish; branchlets and leaf rachis usually densely hirsute with long stiff divaricate hairs, sometimes merely velutinous-pubescent or in juvenile plants glabrate; leaves almost all opposite, those of a pair often very unequal, or one of the leaves sometimes suppressed; leaflets usually 10–20, very variable, often almost all opposite, oblong to narrowly lance-oblong, usually 10–18 cm. long and 1.5–4 cm. wide but often larger, the lowest leaflets of each leaf usually much reduced, acute to long-acuminate at apex, sessile, obtuse to truncate at base and oblique, rarely auriculate on the lower side, densely serrate with apiculate teeth or often entire, membranaceous, above glabrous or nearly so except on the costa, beneath glaucous or glaucescent, usually hirtellous along the nerves and sometimes puberulent between the nerves, but often glabrous or nearly so; flower spikes stout, erect, 3–5 cm. long, short-pedunculate, the rachis densely hirtellous and glandular, the pistillate portion many-flowered (flowers 30–50), dense or interrupted; staminate flowers few, solitary near the base of the spike or 2 to 4 on lateral basal branches less than 1 cm. long; staminate flowers 4 mm.

broad, the perianth glandular; pistillate flowers green, 5–6 mm. long, the ovary sparsely hirtellous and densely covered with golden glands, the lobes 1 mm. wide, glabrate, the outer surface with a few golden glands; stigmas red; fruiting spikes 12–18 cm. long or longer, many-fruited; fruits oval or obovoid, about 2.5 cm. long and 2 cm. thick, densely velutinous-hirsute and covered with sessile glands; nut smooth, broadly rounded at base and apex, the endocarp less than 1 mm. thick.

Type in the U. S. National Herbarium no. 1,226,388, collected in moist forest at El Muñeco, south of Navarro, Province of Cartago, Costa Rica, altitude about 1,400 meters, February 8, 1924, by Paul C. Standley (no. 33620.)

The following additional collections represent the same species:

COSTA RICA: Juan Viñas, alt. 1,260 m., in open pasture, June, 1922, *C. H. Lankester*. La Estrella, Province of Cartago, *Standley* 39217, 39446. Alto de la Estrella, *Standley* 39122. El Muñeco, *Standley* 33501, 33504; *Standley & Torres* 50870, 50874, 50969, 50986, 51078, 51204.

The genus *Alfaroa* is related to *Juglans*, but differs in several important characters. It is unique in the Juglandaceae in having opposite leaves. It is difficult to make a definite decision regarding the arrangement of the leaves, but it is certain that most of them are opposite, and always those on young sterile branches. Occasionally on the older, larger branches there is a single leaf at a node.

In *Juglans* the leaves have a terminal leaflet. In that genus, of course, the nut is rugose, and usually much roughened. I did not notice that the foliage of *Alfaroa* had any odor suggestive of that of walnut leaves, but the glands upon the leaves would suggest the possibility of an aromatic odor.

It is in the inflorescence that the two genera exhibit the greatest divergence. The staminate flowers of *Juglans* are borne in slender drooping catkins; in *Alfaroa* they are borne singly at the base of the erect pistillate spike, or upon two short special lateral branches.

Trees of *Alfaroa* are abundant in the wet mountains south of Cartago, especially at El Muñeco, where they are plentiful among other trees on the tops of the hills. The plants sometimes flower when they are mere shrubs, and the aspect of the mature tree does not suggest a walnut tree. The pale under surface of the leaves is striking, and the young leaves are usually handsomely colored with red and pink. The long spikes of small fruits, recurved by their weight, are borne in great profusion.

For this tree I was given by a guide the name *gaulín*, but this name was disputed by other persons. No use is made of the nuts, apparently. I have not seen the nuts when mature and fresh, and do not know whether they are edible.

ZOOLOGY.—*Five new Chinese squirrels.*[1] A. BRAZIER HOWELL, U. S. National Museum.

Among the Chinese mammals in the United States National Museum are specimens representing five new races of sciuromorph rodents, which may be known as follows:

Eutamias asiaticus umbrosus subsp. nov.

Type.—Male adult, skin and skeleton no. 240744, U. S. National Museum, from 140 miles south of Lanchowfu, Kansu, China; August 21, 1923. Collected by F. R. Wulsin, National Geographic Society Central China Expedition; original number 1118.

Diagnosis.—A dark colored chipmunk differing from *intercessor*, its nearest ally, in the absence of gray hairs throughout the darker areas of the head and shoulders. The coloration of the head is darker and duller, and the gray tips to the hairs upon the upper side of the tail practically hide any ochraceous markings.

Skin.—As above, with the transition between the color of the sides and the buffy whitish of the under parts more abrupt than in *intercessor*. The whole anterior half of the dorsum presents a much more saturate appearance, the pelage is longer and there is a more pronounced ochraceous overwash on the two medial light stripes of the middle back. The feet are also slightly darker and more ochraceous, this being more pronounced upon the fore feet.

Skull.—As in *intercessor* but a bit more slender and bullae smaller, although this difference may not hold good in series, as but one good adult skull is now available.

Measurements.—Collector's measurements of the type are: head and body, 155; tail, 115; foot, 38; ear, 17. Total length of the skull is 42 mm.

Material.—Four specimens: two from 120 and 140 miles south of Lanchowfu, and two from Sungpan, Szechwan.

Remarks.—Although the skins are in summer pelage it is obvious from the coat that it is a more strictly mountainous form than is *intercessor*. The Kansu examples are evidently from the north slope of the Minshan Range of mountains, which marks the boundary between that province and Szechwan, while the Sungpan specimens are from just south of this range. Whether the race is confined to this circumscribed region is a matter for conjecture.

Dremomys rufigenis lentus subsp. nov.

Type.—Male adult, skin and skull no. 240384, U. S. National Museum, from near Wenchuanshein, Szechwan, China, altitude 6000 feet; August 14, 1924. Collected by D. C. Graham; original number 14.

Diagnosis.—A rather large race, with back, flanks and cheeks uniformly colored. Rufous of underparts confined to chin and upper lips, anal region, and faintly along the inner margin of the hind legs. Postauricular spots buffy.

Skin.—With the exception of the postauricular spots, which are rather well defined, the whole upper surface, including feet, flanks, head and cheeks, are uniformly colored, the paler annulations of the hairs being more olivaceous than brown. The tail as usual is darker because of the greater preponderance

[1] Received January 19, 1927.

of black upon the hairs. Below the rufous areas are rather sharply confined to a narrow space a couple of millimeters wide along the upper lips and upon the chin, and in the anal region, almost exclusively upon the base of the tail, but a narrow border of this color extends along the inner side of the hind leg. The throat, chest and belly are overwashed with gray showing a faint suggestion of buffiness. The under side of the tail is paler than the upper only because there is less black distad upon the hairs.

Skull.—The right zygoma is broken and the occipital and bullae are missing. On the whole the skull resembles that of *belfieldi*, but the anterolateral parts of the nasals extend farther ventrad, the premaxillae extend a marked distance farther caudad beyond the nasals, and the incisors are longer and heavier.

Specimen.—One, the type.

Measurements.—Collector's measurements are as follows: head and body, 200; tail, 155; foot, 50. The total length of the skull is about 54; interorbital width, 14.3; shortest length of nasals, 16.8; tips of nasals to caudal terminations of the premaxillaries, 20.7 mm.

Remarks.—No specimen of the Yunnan race *ornatus* is available, but this is easily distinguished from *lentus* by the ferruginous cheeks extending nearly to the level of the ears. In the same respect the latter differs from the typical race, and from *belfieldi* which has not only bright cheeks but much ferruginous in the tail as well.

Sciurus caniceps canigenus subsp. nov.

Type.—Male adult, skin and skull no. 241509, U. S. National Museum, from Hayenhsien, Hangchow Bay, Chekiang, China; December 10, 1925. Collected by Arthur de C. Sowerby; original number 1515.

Diagnosis.—A rather small race. Chin and cheeks very gray and without facial markings. No silvery tips to the hairs of the tail, and the terminal tuft exhibits a tendency to be black at base.

Skin.—The dorsal surface is of the normal sciurine annulated pattern, perfectly uniform save for a barely appreciable tendency toward darkening upon the head, though not upon the shoulders. The dorsal hairs have pale tips and the general tone of this surface varies from brownish to paler and grayer, this possibly being due to age but not to season. The cheeks, muzzle and chin are dark silvery gray with no vestige of brown. The ears are short and scantily haired and there is a whitish postauricuar spot entirely hidden by the ears in the dried skins. The tail is unicolor with the back save that the annulations are coarser. There are no white tips to the caudal hairs but the terminal tuft exhibits a tendency—very strongly marked in one individual—to be black at base with the usual buffy tips to the hairs. The feet are gray, modified by the presence of black hairs. The gray of the chin extends upon the throat, but in the grayer specimens especially this is altered upon the chest to a creamy tint, and in the browner ones, to a faintly ochraceous overwash, which extends over the belly and the inside of the hind legs.

Skull.—As with so many sciuromorphs, there is nothing particularly distinctive cranially, save that the skull is much smaller than in true *caniceps*.

Measurements.—Collector's measurements of the type are: head and body, 194; tail, 156; hind foot, 47; and ear, 21 mm. Measurements of the skull are: total length, 50; zygomatic width, 30.5; interorbital width, 17; and upper tooth row, 10 mm.

Material.—Two specimens from Kangpu and three from Haiyenhsien, both localities in Chekiang.

Remarks.—The relationship of this race unquestionably lies with *caniceps*, although it may ultimately be advisable to assign it full specific rank. The occurrence of a squirrel of this group so far east in China is somewhat of a surprise. As the specimens at hand were taken in winter it is evident that this form does not assume a brighter coat at this season as do some of the other subspecies. Unfortunately, the only skin available of true *caniceps* is in this bright pelage, but it is evident that *canigenus* is browner about the top of the head, the feet are more silvery (less buffy), and *caniceps* entirely lacks the ochraceous wash of the underparts.

Petaurista rubicundus, sp. nov.

Type.—Nursing female, skin only; no. 240857, U. S. National Museum, from Mapientung, Szechwan, China. Killed by native hunters in the fall of 1924 and secured by D. C. Graham.

Diagnosis.—A flying squirrel with underparts light but bright rufous; face, chin, sides of neck and feet darker rufous, and hairs of the remainder of the body giving the appearance of being broadly tipped with the same color. Tip of tail black.

Skin.—The underparts are palest mediad, being almost apricot color, but gradually deepening to intense rufous upon the throat and borders of the membranes. The feet are of the same color but a trifle darker. The pelage of the dorsal surface is thick and full, plumbeous at base, the shorter hairs with brown tips. The very numerous guard hairs are annulated first very dark brown, then black for one or two millimeters followed by ochraceous rufous for some ten millimeters, and finally, short tips of glossy black, the latter hardly distinguishable in general effect. The ears are thin and almost hairless, and the postauricular spots are not differentiated. The hairs of the face are deep rufous with plumbeous bases and short black tips, resulting in a rich effect. The proximal portion of the tail is dull mahogany, with short black tips that gradually lengthen caudad until the tail tip is entirely black. The skin is unaccompanied by measurements but the hind foot has a length of about 72 mm.

Material.—One specimen, the type.

Remarks.—The type is a flat skin in beautiful pelage and the animal was skinned through the mouth in a truly expert manner, leaving no discernible break in the pelt. Unfortunately the skull is missing, but the specimen is evidently so different from anything heretofore described that I have no choice but to name it. An effort to establish tentative relationship with some of the Indian members of the genus was without result.

Petaurista sulcatus, sp. nov.

Type.—Female adult, skin and skull no. 219206, U. S. National Museum, from Hsinlungshan, 65 miles northeast of Peking, Chihli, China, altitude 3000 feet; August 18, 1917. Collected by Arthur deC. Sowerby; original number 1017.

Diagnosis.—A small *Petaurista* with dorsal coloration of the general type of *P. melanopterus*, *leucogenys*, etc. Maxillary incisors, very broad, each with a well-defined groove.

Skin.—The hairs of the middle back are plumbeous at base and browner distad, while numerous longer hairs have buffy tips. The hairs of the sides, especially upon the hips, and of the upper parachutes, lack the browner distal portion mentioned above and appear almost black, except for the buffy tips. There is but the suggestion of an ochraceous spot behind the ear, and ochraceous areas upon both eye lids. The remainder of the head is distinctly lighter than the back and much grayer. The dorsum of the feet is so dark as to be practically black, ticked with a few buffy hairs. Upon the under surface of the body proper of the type specimen the hairs are palely plumbeous at base with white tips upon those over the throat and hinder belly, but with buffy tips elsewhere, while the hairs of the ventral surface of the parachute are wholly ochraceous. In the skin of the topotype these latter have plumbeous bases. There is a sharply-defined sooty spot upon the chin as is usual in many species.

Skull.—In general conformation the skull much resembles that of *leucogenys*, but the total breadth, as well as the width of the rostral tip, is narrower, and the interpterygoid fossa is much deeper. The molariform teeth are of the same type as in *melanopterus*, the premolar being a trifle smaller than the first molar. The maxillary incisors are broad (3 mm.) with a well defined, broad groove laterad to the middle. Close inspection shows that this groove exhibits a tendency toward doubleness, with an extremely faint ridge between. The mandibular incisors are correspondingly robust.

Measurements.—Collector's measurements of the type and topotype are: head and body 310–305; tail, 343–330; foot 65–63; and ear, 40 mm. Measurements of the skulls are: condylobasilar length, 54–52.5; zygomatic width, 41.5–41; interorbital width, 15–14.6; maxillary tooth row, 13.7–14; and greatest width of maxillary incisive alveoli, 8.7–9.

Material.—Three specimens: two, including the type, from Hsinlungshan, and one skin without skull from Eastern Tombs, Chihli.

Remarks.—All specimens of the Chinese members of this genus of what may be termed the normal sciuropterine type of coloration have heretofore been referred to either *P. melanopterus*, *xanthotis*, or *filchnerinae*. The last is a large squirrel probably identical with *xanthotis*. Since Milne-Edward's original description of the last-mentioned, the only published record of its capture noted is that by Lyon (1907) of a specimen from Kansu. This is before me and seems to be at least subspecifically distinct from *melanopterus*, and differences in the molar pattern renders it not unlikely that the relationship is not that close. At any rate, these flying squirrels are of large size with skulls normal, including narrow, simple, maxillary incisors.

The reference of chief interest in the present connection is that of Pere Huede (Mems. Hist. Nat. Emp. Chinois, IV, 1898). In this there is quite lengthy discussion of the molar pattern of several flying squirrels, but none of the incisors. His identifications need careful checking, to say the least, but his plates seem to be exceptionally good and accurate. Turning to his figures illustrating several views of his so-called *Pteromys melanopterus* it is at once seen that this is a very different animal from that of Milne-Edwards, distinguishable instantly by the broad, *grooved*, maxillary incisors. Comparison shows that these figures are exceptionally fine representations, in every respect, of the skull of *P. sulcatus*.

It was at first thought that this character was probably of generic significance, but it was found that the maxillary incisors of *P. fulvinus*—a very different type of squirrel—may vary from the pattern normal for the genus in somewhat the same direction. In four skulls from Kashmir two have simple incisors, a third is faintly ridged and grooved, and a fourth more definitely has four faint ridges and three equally faint grooves of the same width between them. To my mind this circumstance at once settles in the negative the question of generic, or even subgeneric, separation of the Chinese examples.

The skin from Eastern Tombs, without skull, date, or measurements, is almost certainly a winter specimen of this species. Its pelage is denser, it largely lacks the ochraceous tone to the underparts of the body proper, and the head is considerably darker; but it is similar in other respects.

ENTOMOLOGY.—*Notes on the Dexiid genera* Cordyligaster *and* Eucordyligaster.[1]

J. M. ALDRICH, U. S. National Museum.
(Communicated by S. A. ROHWER.)

In some material received from Professor Melander was a specimen of a yellow *Cordyligaster* from South America; the process of identification led to some results worthy of publication. It would seem that no yellow forms have come to light since the description of two species about eighty years ago.

There are two American genera closely allied in all but one character. In *Cordyligaster* the calypters are very small, while in *Eucordyligaster* they are of normal size. The difference is striking. The former genus has three known species and the latter two; all five are tropical, but one has a wide northern range and is common in the vicinity of the District of Columbia. This species, *Eucordyligaster minusculus*, is so unmistakeable and so well represented in collections that the generic characters may be omitted here.

CORDYLIGASTER Macquart

Cordyligaster Macquart, Dipt. Exot. **2** (pt. 3): 247 (reprint 90). 1843.—Schiner, Novara, 322. 1868.—Van der Wulp, Tijdsch. v. Ent. **28**: 191. 1885; Biologia, Dipt. **2**: 252. 1891.—Coquillett, Type-Species N. A. Dipt. 527. 1910.—Adams, in Williston's Manual, 356. 1908.—Townsend, Ins. Ins. Menst. **4**: 122. 1916.

Megistogaster Macquart, Dipt. Exot. Suppl. **2** (pt. 2): 185 (reprint 212) 1851.—Townsend, Ins. Ins. Menst. **4**: 7. 1916.

Cordylidexia Giglio-Tos, Ditt. del Mess. **3**: 67. 1894.

Eucordylidexia Townsend, Ins. Ins. Menst. **3**: 41. 1915.

[1] Received January 18, 1927.

The sole original species of *Cordyligaster* was *Dexia petiolata* Wiedemann; *Megistogaster* had two species, of which Townsend designated *fuscipennis* Macquart as type in 1916; *Cordylidexia* was a new name proposed on account of supposed preoccupation, taking *Dexia petiolata* as type. Coquillett, 1910, showed that the name is not preoccupied in the strict sense. *Eucordylidexia* was proposed for a new species, *E. ategulata* Townsend, which Townsend subsequently stated was a synonym of *petiolata*.

Key to Species of Cordyligaster

1. Antennae, palpi, legs and abdomen black.....**petiolatus** Wiedemann.
   Antennae, palpi, legs and abdomen yellow or mostly so.....2
2. Femora with black bands, hind coxae black.....**tipuliformis** Walker.
   Femora and hind coxae yellow.....**analis** Wiedemann.

Cordyligaster petiolatus Wiedemann.

Dexia petiolata Wiedemann, Auss. Zweifl. 374. 1830.

Cordyligaster petiolatus Macquart, Dipt. Exot. **2** (pt. 3): 247 (reprint 90) 1843.—Rondani, Esame.....Ditt. Brasil. 76. 1848.—Schiner, Novara 322. 1868.—Van der Wulp, Tijdsch. v. Ent. **28**: 191. *pl. 6, f. 1, 2.* 1885.—Townsend, Ins. Ins. Menst. **4**: 122. 1916.

Megistogaster fuscipennis Macquart, Dipt. Exot. Suppl. **2** (pt. 2): 186 (reprint 213), *pl. 19, f. 7.* 1851.

Eucordylidexia ategulata Townsend, Ins. Ins. Menst. **3**: 41. 1915.

Originally described from Brazil, and reported from Panama, Costa Rica and Guatemala by Townsend, in 1915. In addition to the specimens mentioned by Townsend, the National Museum now has two from Rurrenabaque, Rio Beni, Bolivia,collected by Dr. Wm. M. Mann on the Mulford Biological Exploration; and one from Belem, Pará, Brazil, collected by F. X. Williams for the Hawaiian Sugar Planters' Experiment Station.

Cordyligaster analis Macquart

Megistopoda analis Macquart, Dipt. Exot. Suppl. **2** (pt. 2) 187 (reprint 214). 1851.

Cordyligaster analis Townsend, Ins. Ins. Menst. **4**: 122. 1916.

Described from a single male from the Amazon. The type had the fourth abdominal segment black except its anterior border. The specimen from Professor Melander, a female which I provisionally place here, is from British Guiana (Parish, collector); it has the fourth abdominal segment wholly yellow, as well as the legs and coxae. The only black color is on the thoracic dorsum, base of scutellum, metanotum, and a spot just above the hind coxa, which fades out upward. There is only a single pair of orbital bristles, the upper. The dorsum and pleurae are covered with golden pollen, but on the former the black remains visible in four large oval spots arranged in a square.

Cordyligaster tipuliformis Walker

Cordyligaster tipuliformis Walker, Trans. Ent. Soc. new ser. **4**: 205 (reprint 17). 1857.—Townsend, Ins. Ins. Menst. **4**: 122. 1916.

Described from a female, from "South America." I know of no other specimens. Townsend thought this and *C. analis* must have been described

from immature or bleached specimens, but my new yellow specimen is perfectly normal, rendering this explanation improbable. Walker describes the abdomen as ferruginous, the base of the second and third segments testaceous.

EUCORDYLIGASTER Townsend

Eucordyligaster Townsend, Ins. Ins. Menst. **4**: 123. 1916.

The type was designated as *Cordyligaster septentrionalis* Townsend. Within recent years the National Museum has received a cotype of *Cordyligaster minusculus* Van der Wulp, which has been compared with the type of *septentrionalis* and proves to be the same species.

EUCORDYLIGASTER MINUSCULUS Van der Wulp

Cordyligaster minusculus Van der Wulp, Biologia, Dipt. **2**: 252, *pl. 6, f. 7, 7a.* 1891.—Banks, Ent. News **18**: 450. 1907.—Thompson, Psyche **17**: 212. 1910.—Johnson, Psyche **19**: 103. 1912.—Daecke, Ent. News **26**: 42. 1915.

Eucordylidexia minusculus Giglio-Tos, Ditt. del Mess. (pt. 3) 67. 1894.

Cordyligaster septentrionalis Townsend, Ann. Ent. Soc. Amer., **2**: 212. 1909; Ins. Ins. Menst. **3**: 41. 1915.

The species, as already stated, occurs commonly about Washington. Daecke notes it at Marietta, Pa., the farthest north of the records. Thompson pointed out the synonomy of *septentrionalis*.

EUCORDYLIGASTER NYOMALA Townsend

Cordyligaster nyomala Townsend, Ins. Ins. Menst. **2**: 93. 1914.

Eucordyligaster nyomala Townsend, Ins. Ins. Menst. **4**: 123. 1916.

Known only in the single male type from Ñomala, Peru. It is readily distinguished from *septentrionalis* by its yellow palpi; the thoracic dorsum is covered with golden pollen with faint dark stripes in front; the antennae are dark red.

ENTOMOLOGY.—*Descriptions of new genera and species of Mallophaga, together with keys to some related genera of Menoponidae and Philopteridae.*[1] H. E. EWING, U. S. Bureau of Entomology. (Communicated by S. A. ROHWER.)

In the Chapin collection of ectoparasites, recently donated to the United States National Museum, are some rare, and in many instances unusual, Mallophagan specimens. These specimens, mounted by Dr. E. A. Chapin, are in excellent condition for showing many of those minute chitinous structures which are coming to have such an important part in our recent diagnoses of Mallophagan genera and species. In this paper six new genera are established. Although no figures are given, it is believed that the keys supplied will show probably more

[1] Received January 19, 1927.

clearly than figures would, the significant taxonomic characters and also the relationships of the newly established genera to the previously described ones. The generic concept used in establishing these genera predicates that all the species of the genus shall possess two or more correlated characters of more than specific importance. In addition to the six new genera proposed, seven new species are described.

A New Species of Trimenoponidae

Philandesia foxi, new species

Forehead provided with only small setae. Antennae four-segmented; second segment with very broad, truncate process, bearing two long setae at angle; last segment longer than broad. A short seta is situated on expansion over antennal fossa just in front of the eye.

Prothorax about two-thirds as broad as head and with a marginal row of about a dozen long setae, as well as a pair of small spine-like setae on the angles and another pair behind the first pair of long marginal setae. Pterothorax slightly broader than the prothorax and with straight, strongly divergent sides.

Each abdominal segment typically with a distinct, posterior, transverse row of setae and an indistinct anterior transverse row. Next to last segment of male about twice as long as the others. Last segment of female with a double comb of short, marginal setae.

Genital armature of male very peculiar. The structure taken to be the basal plate arises from about the middle of the abdomen and is divided into four processes; two short outer processes that are broadened and provided with a spine-like appendage distally; and two long inner processes. Parameres free, straight and broadened at their tips; endomeres united, extending beyond the tips of parameres.

Length of female, 2.42 mm.; width, 0.93 mm. Length of male, 2.20 mm. width, 0.81 mm.

Type host and *type locality.*—*Marmota flaviventris* from Brewster, Washington State.

Type.—Cat. no. 40135, U. S. N. M.

Described from one male (holotype) taken from type host collected 1918, by F. W. Logan, Brewster, Washington, and from one female collected at New York City, from a rat (*Rattus norvegicus*) and sent in by Dr. Carroll Fox. The manuscript name, without description, of this species was published in a list of ectoparasites of the genera *Rattus* and *Mus* for the New World by Fox in his "Insects and Disease of Man," page 217. This name, so published in 1925, is a *nomen nudum*, and becomes validated with this description. *P. foxi* differs from *P. townsendi* Kellogg and Nakayama in a number of characters. It has eight large setae on the posterior margin of the head instead of the four as on *townsendi*, and at least a dozen large marginal setae on the prothorax instead of the half dozen of the other species. This species is also related to species of *Dennyus* in a number of ways.

New Menoponidae

Acolpocephalum, new genus

Last antennal segment subhemispherical. Eyes degenerate, situated on margin just behind antennal notch. Pterothorax enlarged, broader and much longer than prothorax. Abdomen with nine segments, first and second similar. Legs very short and stout; femora inflated; first tarsal segment extending distally and overlapping second for over half the length of the latter. Tarsal claws very small and weak, almost vestigial on second and third legs.

Genotype and its *host species.—Acolpocephalum brevipes*, new species, from *Ptiloris victoriae*.

Only a single species is included at present in this new genus. The tarsal characters found in this species are different from those of any Mallophagan species known to the writer.

Acolpocephalum brevipes, new species

Head compact, as broad as long. Free margin of forehead almost but not quite, evenly rounded. Mandibles sharply pointed, without crushing surfaces or transverse ridges; left mandible slightly smaller than right and with two sharp, tooth-like projections at the end. Temporal lobes subquadrangular.

Prothorax about three-fifths as broad as the head, with rounded lateral margins and a peg-like spine on anterior corner. Pterothorax as broad as greatest width of abdomen, sides slightly outwardly curved and strongly divergent posteriorly. A few spine-like setae are situated at each posterior corner of pterothorax.

Abdomen about one and a half times as long as broad and with posterior end broadly and evenly rounded. A long seta springs from the lateral margin of each segment, which typically bears in addition a transverse row of setae.

Legs almost of the same size, but second pair slightly larger than the first and the third slightly larger than the second. Femora of all the legs about two-thirds as broad as long, those of third pair not quite as stout as those of the other two pairs. Tibiae of all legs very short and stout; those of first pair about one and a half times as long as broad at their distal ends. Last segment of each tarsus very stout, strongly curved on outer margin and terminated with minute to vestigial claws; claws on tarsus I best developed, the outer about twice as large as the inner.

Length of female, 1.11 mm.; width, 0.41 mm.

Type host and *type locality.—Ptiloris victoriae*, from Queensland, Australia.

Type.—Cat no. 40136, U. S. N. M.

Described from a single female (holotype) taken from skin of rifle bird, *Ptiloris victoriae*, from Atherton Tableland, Queensland, Australia.

Chapinia, new genus

Forehead greatly reduced, broadly rounded in front. Mandibles situated almost approximate to anterior, free margin of clypeus. Last segment of antenna capitate. Antennal fossa covered above by a transversely notched

expansion of the head, the posterior part of which bears the double cornea of the eye on its free margin. Prothorax large, with almost straight, posteriorly convergent sides. Pterothorax undivided, with almost straight, posteriorly divergent sides. Abdomen broad, of nine segments in female and ten in male; first and second segments similar. First segment of each tarsus but slightly overlapping the second; tarsal claws well developed and subequal on each tarsus. Genital plate of male broad and flat, not rod-like.

Genotype and its *host species.*—*Chapinia robusta*, new species, from *Ceratogymna atrata.*

This genus is established for the single new species, and at the suggestion of Dr. Chapin, the collector of the specimens. It is related to *Actornithophilus* Ferris but differs from Ferris' genus in the shape of the forehead, position of the mandibles and type of genital armature of the male.

Chapinia robusta, new species

Head decidedly "hat-like," the almost straight contour of the sides of the forehead is continued far beyond the bases of the antennae and along the side of expansions over the antennal fossae. Mandibles small, equal, simple and pointed at tips. Antennae of typical *Menopon* type, but third segment revealing traces of its fused condition by breaking off easily near its base at suture line; last segment slightly longer than broad.

Prothorax about two-thirds as broad as head and bearing a conspicuous spine at each anterior corner. Pterothorax the mirror of prothorax considerably enlarged. At each posterior corner of pterothorax there is a lateral pecten of five or six spine-like setae, two of which in the female are much longer than those of the male.

Abdomen broad, constricted somewhat in front and bearing a few very long lateral setae, those on the seventh and eighth segments being especially conspicuous.

Genital armature of male large and heavily chitinized. Basal plate extending backward from fifth abdominal segment, it is broad and strap-like. Posteriorly the basal plate divides into two slender lateral arms and a stout, distally split central piece; which structures bear the parameres and endomere respectively. Parameres rather slender, upwardly curved, more or less hook-like structures which encompass the endomere laterally. Endomere large and curved, plate-like with a pair of lateral horns. Penis absent.

Legs long, the tibial segments particularly being slender. Patch of setae on each posterior femur pronounced. Second tarsal segments of all the legs very slender.

Length of male, 1.59 mm.; width, 0.70 mm. Length of female, 2.00 mm.; width, 0.95 mm.

Type host and *type locality.*—*Ceratogymna atrata* from Congo, Africa.

Type.—Cat. no. 40137, U. S. N. M.

Described from one male (holotype) and one female (paratype) collected by E. A. Chapin from the skin of hornbill, *Ceratogymna atrata*, taken November 3, 1917, at Nytonga, Congo, Africa.

Amyrsidea, new genus

Forehead reduced and evenly rounded in front. Antennae five-segmented (third segment showing suture near base), with last segment cylindrical. Antennal fossa covered above by a transversely sutured expansion of the head. Eyes wanting. Pharyngeal sclerite well developed. Prothorax large, without sternum, the sternal region being largely covered by the plate-like coxae of first pair of legs. Pterothorax broader than long and with straight posterior margin. Female with a whorl of conspicuous subequal spines on the posterior margin of last abdominal segment. Typically each abdominal segment is provided on each side ventrally with a brush of setae, smaller than those which clothe the body. Femora of third pair of legs each with a ventral patch of setae. First tibiae without spurs at distal ends; second and third tibiae provided with tibial spurs. First tarsal segment of leg I large and overlapping the second segment; first tarsal segment of legs II and III much smaller and not overlapping second segment. Subequal tarsal claws well developed on all the legs. Genital armature of male compact but complicated. Basal plate, plate-like, but very deeply incised posteriorly for the reception of the complicated endomeres and bearing thorn-like projections from the inside margins of lobes bounding incised space. Parameres free, movable appendages.

Genotype and its *host species.*—*Menopon ventrale* Nitzsch, from *Argusianus argus*.

This genus is established for the peculiar *Menopon* of *Argusianus* species The writer has examined three males and three females of this species taken from the argus pheasant, *Argusianus argus*, collected at Trong, Lower Siam, and one female from *Argusianus grayi* taken in West Borneo. The absence of eyes, the presence of tibial spurs on the second and third tibiae, the whorl of spines on the last segment of the female and the peculiar and complicated genital armature of the male constitute a striking combination of characters for the delimitation of the genus.

Numidicola, new genus

Forehead reduced and broadly rounded. Antennae long, five-segmented; third segment small and forming a pedicel to the fourth; fifth segment long, filiform. Antennal fossae roofed over above by an unsutured expansion of the head. Eyes vestigial and on the free margin of expansions over antennal fossae. Pharyngeal sclerite large, conspicuous. Prothorax very large, about as broad as head; prosternum wanting; large, plate-like precoxae meeting on median line. Pterothorax not larger than prothorax, very short, sides markedly divergent posteriorly. Abdomen with very short segments, eight in the male and nine in the female, each typically with a single transverse row of setae. First tarsal segment of each tarsus but slightly if at all overlapping the second. Each tarsus terminated distally with two well-developed, equal claws. Genital armature of male with rod-like basal plate, free parameres and large distally free endomeres.

Genotype and its *host species.*—*Numidicola longicornis*, new species, from *Numida ansorgii*.

Included with the type species in this genus is the *Menopon antennatum* of Kellogg and Paine. The combination of two characters is enough to dis-

tinguish this genus from the others of *Menoponidae*. These are the presence of long, filiform, five-segmented antennae and the position of the eyes on the margins of the undivided expansions of the head covering the antennal fossae.

Numidicola longicornis, new species

A fragile, very hairy, golden colored species. First segment of antenna slightly longer than broad; second segment cylindrical, twice as long as first; third segment minute, enlarged toward the tip, about half as long as the fourth; fourth about half as long as the fifth and broadest toward its distal end; fifth segment filiform, not clubbed, although it is broadest near the tip; it is about one and a half times as long as three and four combined. Eyes vestigial, without pigment, but showing two degenerate corneas.

Prothorax as broad as the head, broadly rounded posteriorly and bearing a marginal row of closely set, long setae. Pterothorax with a few spine-like setae on lateral margins and a row of close-set, long setae on posterior margin. Abdominal setae in close-set rows, some of them somewhat flattened. Last abdominal segment of male studded above with many short spines.

Genital armature of male: Basal plate long, flat, widening posteriorly; parameres long, slender slightly curved and blunt-pointed at tips; endomeres similar to parameres but stouter, attached to sac, outwardly curved. The endomeres extend posteriorly slightly beyond the parameres.

Hind legs slightly larger than the middle ones; femur III with ventral patch of setae. Tibiae II and III each with about eight spines on inner side, the more distal being the stoutest.

Length of male, 1.35 mm.; width, 0.64 mm. Length of female, 1.26 mm.; width, 0.71 mm.

Type host and *type locality.*—*Numida ansorgii* from British East Africa.

Type slide.—Cat. no. 40138, U. S. N. M.

Description based on five males and one female (two immature specimens were obtained) taken from the skin no. 243182 U. S. N. M., of the guinea, *Numida ansorgii*, collected at Tana River, British East Africa, August 26, 1912. This species differs from *N. antennatum* (Kellogg and Paine) in the shape of the antennal segments and in the structure of the genital armature of the male.

KEY TO SOME RELATED GENERA OF MENOPONIDAE, INCLUDING THOSE DESCRIBED IN THIS PAPER

1. Antennal fossae open above (ocular emarginations deep) or only slightly covered by expansions from head; last segment of antenna usually clavate, rarely capitate; temporal lobes large, somewhat subrectangular; eyes present, and not vestigial.....2
   Antennal fossae largely or entirely covered above by lateral expansions from the top of head; last segment of antenna variously shaped; temporal lobes rarely subrectangular; eyes usually present, but frequently degenerate 6
2. Posterior femora and abdominal sterna without definite ventral patches of setae, although combs of spines may be present.....3
   Posterior femora and certain abdominal sterna with definite ventral patches or brushes of setae.....4

3. Pterothorax (meso-metathorax) enlarged, much larger than prothorax; first segment of each tarsus overlapping the second for about half the length of the latter; tarsal claws minute to vestigial. Small stout lice on parrots.....**Acolpocephalum**, new genus
   Pterothorax normal; first segment of each tarsus slightly or not at all overlapping the second; tarsal claws not vestigial
   Colpocephalum Nitzsch
4. Setae of femoral and sternal patches smaller than those clothing the body.....**Heleonomus** Ferris
   Setae of femoral and sternal patches as large as those which clothe the body.....5
5. Forehead broad and rounded with large mandibles in normal position; genital armature of male weak with long rod-like basal plate
   Actornithophilus Ferris
   Forehead reduced, triangular, with small mandibles situated approximate to the front margin of clypeus; genital armature of male large with broad basal plate.....**Chapinia**, new genus
6. Posterior femora and certain abdominal sterna with definite ventral patches or brushes of setae.....7
   Posterior femora and abdominal sterna without definite ventral patches or brushes of setae.....8
7. Pharyngeal sclerite present; second abdominal sternite sometimes with a pair of asters of heavy spines on posterior margin.....8
   Pharyngeal sclerite wanting; second abdominal sternite never with asters of spines.....**Dennyus** Neumann
8. Temporal region of head of usual shape, and much broader than forehead and prothorax; posterior margin of last abdominal segment without row of spine-like setae; prosternum present; last antennal segment capitate
   Myrsidea Waterston
   Temporal region reduced, but little broader than forehead or prothorax; prosternum wanting; procoxae expanded into body sclerites; last antennal segment not capitate.....9
9. Expansion of head skeleton covering top of antennal fossa divided by a transverse suture; female with a row of stout spines on the posterior margin of last abdominal segment.....**Amyrsidea**, new genus
   Expansion covering top of antennal fossa entire; female without spines on posterior margin of last abdominal segment
   Numidicola, new genus

New Philopteridae

Echinophilopterus, new genus

Clypeus separated from head by distinct clypeal suture; appearing deeply incised in front because of the lateral chitinizations (clypeal bands) extending beyond the signature for about a third of their length. Trabeculae very large, long and rounded at their tips. Antennae short. Abdomen short, almost circular and bearing many short, stout spines below on first, second and possibly third or fourth segments. Other characters similar to those of *Philopterus* Nitzsch.

Genotype and its *host species.—Echinophilopterus chapini*, new species, from *Tanygnathus muelleri*.

This new genus is established for those parrot-infesting *Philopteri* that have the abdomen studded below with short, stout spines. It was suggested to the author by Dr. E. A. Chapin, who collected the type species. Besides the type species and another new one described in this paper, there are included in this genus some of the species in Piaget's *forficulatus* group. The writer was at first inclined to make *forficula* Piaget the type of this genus but changed his mind when it was observed that Piaget does not mention the group of spines on the ventral surface of the abdomen nor give any definite type host species for this louse.

Echinophilopterus chapini, new species

Head large for the size of body, with long forehead. Signature of clypeus much longer than broad, sides very slightly outcurved, and with a short, tongue-like anterior median process having a rounded hyaline margin. Lateral chitinizations of clypeus pronounced, extending beyond the signature by about a third of their length, pointed and hyaline at their tips; each bears two prominent, curved setae above. Trabeculae reaching to the middle of second antennal segment, slightly recurved and evenly rounded at tips.

Prothorax about two-thirds as large as pterothorax, sides straight and slightly divergent posteriorly. Pterothorax with a long seta on each lateral margin, in front of which is a small spine-like seta and behind which are two setae, the most posterior of which is the longer.

Abdomen almost as broad as long and in both sexes bearing below many short, stout, sharp spines which are situated chiefly on the first three segments. In three specimens one or more spines are also on the fourth segment.

Genital armature of male stout, compact and well chitinized. Basal plate about twice as long as wide, sides almost straight and subparallel. Parameres short, stout, outwardly curved hooks, in length equal to about half the width of basal plate. Endomeres wanting. A penis-like structure extends almost to the tips of parameres.

Length of male, 1.66 mm.; width, 0.71 mm. Length of female, 2.06 mm.; width 0.87 mm.

Type.—Cat. no. 40139, U. S. N. M.

Described from four specimens, two males and two females, taken from skins of a parrot, *Tanygnathus muelleri*, collected in the Celebes.

Echinophilopterus tanygnathi, new species

Head large, particularly the temporal region. Signature of clypeus much longer than broad, sides almost straight and parallel; a short, tongue-like projection extends from the middle of the anterior end of the signature. Lateral chitinizations of clypeus very long, with anterior free ends expanded, inwardly cupped and hyaline; above slightly in front of the middle each bears two long curved setae and near the base a single, straight seta. Trabeculae reaching almost to the middle of the second antennal segment, decidedly broadened at their bases.

Prothorax almost as large as pterothorax, sides straight and very slightly divergent posteriorly. No lateral marginal setae on prothorax, but there is a minute spine and a much larger seta at each angle. Chaetotaxy of lateral

margin of pterothorax: First a small spine, next a long more or less flagelliform seta equal to about half the width of the pterothorax, next a similar seta half as long, last a very long seta equal to three-fourths the width of the pterothorax.

Abdomen distinctly longer than broad. Ventral spines distributed over the central halves of the first three segments. Last segment of abdomen broader than long.

Length of female, 1.79 mm.; width, 0.73 mm.

Type host and *type locality.*—*Tanygnathus burbridgei* from Sulu Island, Philippine Islands.

Type.—Cat. no. 40140, U. S. N. M.

Described from a single female (holotype) taken from a skin of a parrot, *Tanygnathus burbridgei*, collected at Mt. Bud Dajo, Sulu Island, Philippine Islands, October 11, 1906.

Differs from *E. chapini* in having a longer central process on anterior end of signature of clypeus, in having shorter and stouter and differently shaped trabeculae and in some minor characters.

Physconelloides, new genus

Clypeus broadly and evenly rounded in front; clypeal suture present. Forehead with a pair of large, backwardly pointing, lateral horn-like or spine-like processes which arise from the chitinous thickening just behind the clypeal sutures. A similar but smaller pair of processes arise ventrally from the clypeus just in front of the clypeal sutures. Antennae short, second segment longest. Temporal lobes large, squarish. Eyes concealed from above the lateral expansions of the temporal lobes. Esophageal sclerite present and well developed. Prothorax smaller than the pterothorax, with sides strongly divergent posteriorly. Pterothorax short, but very broad with rounded lateral margins. Abdomen eight-segmented in both sexes. Genital armature of male very long and slender; basal plate composed of two long chitinous rods; parameres free, conspicuous; endomeres not united distally. Tarsal claws unequal, the inner being the stouter and having a different curve from the outer.

Genotype and its *host species.*—*Physconelloides ceratoceps*, new species, from *Leptotila ochroptera chloraucheuia.*

This new genus is clearly related to *Physconella* Paine but differs from Paine's genus in having the large horn-like process on the underside of the clypeus in addition to those on the sides of the forehead, and in having the angulate temporal lobes instead of rounded ones. The type species is the only one included in the genus.

Physconelloides ceratoceps, new species

Clypeus heavily chitinized along the front margin; ventral processes recurved, equal to the second segment of antennae in length. Lateral processes of head about one and a half times as long as ventral processes and overlapping most of the first antennal segment. Antennae short; first segment as broad as long; second segment about twice as long as broad and equal to three and four together; fifth segment distinctly longer than fourth.

Temporal lobes squarish, each with a minute spine-like seta on outer corner and two very long setae on posterior margin. Pharyngeal sclerite as broad as long.

Prothorax with a pair of setae just in front of posterior angles. Pterothorax about three times as broad as long, with lateral margins almost evenly rounded and each bearing a large seta near its middle.

Abdomen somewhat pear-shaped in outline with the broadest place behind the middle. Tergal and sternal plates apparently wanting. Pleural plates heavily chitinized and more or less united with each other. Abdomen almost nude except for three long lateral setae on each side of sixth segment and two on each side of seventh segment in the female and two large setae on each side of seventh segment and a posterior marginal pair on the eighth segment of male.

Genital armature of male very slender and delicate; basal plate arising from the chinitized base of first abdominal segment and extending through almost the whole length of the abdomen as two slender rods; parameres outwardly directed, almost straight processes thickened at their bases; endomeres free and similar to parameres.

Coxae of first pair of legs contiguous. Those of second pair of legs separated from each other for a distance about equal to the diameter of one of them by the expanded, plate-like epimera behind the first coxae. The inner tarsal claw of front leg is about twice as big as the outer and differently curved; it is also slightly larger than the outer one on the second and third pairs of legs.

Length of female, 1.65 mm.; width, 0.66 mm. Length of male, 1.11 mm.; width, 0.52 mm.

Type host and *type locality.*—*Leptotila ochroptera chloraucheuia*, from Argentina.

Type slide.—Cat. no. 40141, U. S. N. M.

Described from a male (holotype) and a female (paratype) taken from type host, a pigeon, which was collected at Rio Quia, Las Palmes, Argentina Chaco, July 17, 1920, by Dr. A. Wetmore.

KEY TO SOME RELATED GENERA OF PHILOPTERIDAE, INCLUDING THE TWO NEW GENERA DESCRIBED IN THIS PAPER

1. Forehead produced laterally into a pair of large, recurved horn-like processes 2
   Forehead not produced laterally into horn-like processes 3
2. Temporal lobes rounded; clypeus without ventral spine-like processes **Physconella** Paine
   Temporal lobes angulate; clypeus provided with a pair of large, spine-like processes on ventral side ..... **Physconelloides,** new genus
3. Forehead with membranous flaps (more conspicuous in the male) projecting beyond the lateral margins. (The Giebeliinae of Waterston) .. 4
   Forehead without laterally projecting membranous flaps 5
4. Antennae the same in the two sexes. On petrels ..... **Giebelia** Kellogg
   Antennae different in the two sexes. On giant fulmars and shearwaters ..... **Trabeculus** Rudow
5. Antennae alike in the two sexes; trabeculae very large and usually movable 6
   Antennae different in the two sexes. On owls ..... **Strigiphilus** Mjöberg

6. Forehead irregularly rounded and without hyaline margin to clypeus; trabeculae reduced, immovable, not reaching the distal end of first antennal segment. On owls.....**Eustrigiphilus** Ewing
Without such characters.....7
7. Clypeal region expanded and with hyaline free margin throughout, but rounded and not emarginate in front; antennae very short. On geese, ducks and swans.....**Anatoecus** Cummings
Clypeal region not rounded in front with free hyaline margin.....8
8 Signatural plate divided; antennae long, with segment two distinctly longer than any of the others. On ibises.....**Ibidoecus** Cummings
Signatural plate not divided.....9
9. Clypeal margin deeply incised in front; abdomen bearing many short, sharp spines below. On parrots.....**Echinophilopterus,** new genus
Clypeal margin not deeply incised in front; abdomen without spine on ventral surface.....10
10. Clypeal region bearing above on each lateral chitinization (clypeal band) a tuft of three or more setae. Chiefly on cuckoos
Cuculoecus Ewing
Clypeal region not bearing such lateral tufts of setae
Part of genus **Philopterus** Nitzsch and its derivatives, **Neophilopterus** Cummings and **Dollabella** Cummings.

PROCEEDINGS OF THE ACADEMY AND AFFILIATED SOCIETIES

WASHINGTON ACADEMY OF SCIENCES

194th MEETING

The 194th meeting of the ACADEMY and the twenty-seventh annual meeting was held at the Administration Building of the Carnegie Institution on the evening of Tuesday, January 13, 1925. The meeting was called to order by Vice-President HAZARD, who called upon the retiring President, A. L. DAY, to give his address entitled, *The study of earth movements in California.* President DAY gave a brief account of the events leading to the movement for the cooperative study of earthquakes and earth movements and the formation of the Advisory Committee of Seismology in order to make the cooperation effective. He mentioned the various lines of work, astronomical, geodetic, hydrographic, and geologic, as well as the strictly seismologic, that formed a part of the cooperative scheme, and outlined the parts taken by the various agencies doing this kind of work. Among the new instruments used in this investigation he mentioned the Anderson-Wood torsion seismometer and the sonic sounding device of the Navy Department. He concluded by saying: "Such a number of vigorous agencies, thus brought together, cannot fail to accomplish a great deal more than any one could do alone; such a representative group of agencies, I believe, cannot fail of success." President Day's address is published in full in *Science*, **61**: 323. March 27, 1925.

Following a brief intermission after the address, the annual business meeting of the ACADEMY was held. The minutes of the 26th annual meeting were read and approved. The Corresponding Secretary, FRANCIS B. SILSBEE reported briefly on the activities of the ACADEMY. During the year 35 persons were elected to regular membership, and Dr. SIGURD ORLA-JENSEN

of Copenhagen to honorary membership in recognition of his work in bacteriology. Eighteen resignations were accepted during the year, of whom 7 were resident members, and 5 were dropped for non-payment of dues. The ACADEMY lost by death the following 9 members: ALFRED H. BROOKS, JOHN T. HEDRICK, NED HOLLISTER, F. OMORI, J. J. STEVENSON, A. W. VOGDES, WOODROW WILSON, E. V. WINCHELL, and R. S. WOODWARD.

During the year the Board of Managers held four meetings. In addition to attending to routine business and the election of new members, the Board adopted a resolution in support of the project for a National Arboretum, and designated respresentatives to the International Mathematical Congress at Toronto, to the Centenary Celebration of the Franklin Institute at Philadelphia, and to the Washington meeting of the American Metric Association.

The report of the Recording Secretary, WALTER D. LAMBERT, was read. There were held during the year 9 public meetings, most of them jointly with one or more of the affiliated societies, at which addresses were delivered. The names of the affiliated societies participating, the names of the speakers, the titles of the addresses, and occasional items of interest in connection with them were given.

The report of the Treasurer, R. L. FARIS, showed total receipts of $5,579.86, and disbursements of $4,227.56, with a balance in bank on Dec. 31, 1924, of $3,140.80. The value of the ACADEMY's investments was $16,036.37, and the estimated net worth including all items was $18,669.14.

The report of the auditing committee, consisting of WHITMAN CROSS, G. M. COLLINS, and O. S. ADAMS, was read, which verified the Treasurer's figures. The reports of the Treasurer and of the auditing committee were then accepted.

The report of the editors of the JOURNAL was presented by the senior editor, E. P. KILLIP. Figures were given regarding the number of articles and their distribution among the various branches of science. The general form and policy of the JOURNAL was substantially as during the previous year.

The Committee of Tellers reported that the following officers had been elected for 1925; *President*, VERNON KELLOGG; *Non-resident Vice-Presidents*, J. STIEGLITZ, WILLIAM WHEELER; *Corresponding Secretary*, FRANCIS B. SILSBEE; *Recording Secretary*, WALTER D. LAMBERT; *Treasurer*, R. L. FARIS; *Managers, Class of 1928*, E. C. CRITTENDEN, G. W. MCCOY.

The following Vice-Presidents nominated by the affiliated societies were then elected: *Anthropological Society*, TRUMAN MICHELSON; *Archaeological Society*, WALTER HOUGH; *Bacteriological Society*, W. M. CLARK; *Biological Society*, S. A. ROHWER; *Botanical Society*, H. L. SHANTZ; *American Chemical Society, Washington Section*, LEASON H. ADAMS; *Entomological Society*, A. G. BOVING; *Washington Section, Society of American Foresters*, GEORGE B. SUDWORTH; *National Geographic Society*, FREDERICK V. COVILLE; *Helminthological Society*, B. H. RANSOM.

195th MEETING

The 195th meeting of the ACADEMY was held jointly with the Anthropological Society, the Archaeological Society, and the Biological Society in the auditorum of the Carnegie Institution Building the evening of Tuesday, January 20, 1925. It was devoted to a symposium on *The origin and evolution of man*. President JOHN C. MERRIAM of the Carnegie Institution spoke on the geological aspects of the evidence and the significance of evolution for the future.

There is need to increase the knowledge of what we are by learning how we came into existence and what are the nature and sources of our characters and what is their possible future development. The problem of the evolution of man includes three questions: (1) the history and evolution of man from his origin to the present time; (2) the problem of the evolution of man from a possible ancestral type; (3) the future course of development of the human race. Will it represent evolutionary progress? In general the problem of the evolution of man is part of the larger question of evolution of the whole organic world and can be understood or interpreted mainly through study of this question as a whole. We approach the general problem of evolution from the point of view of comparative anatomy, of embryology, of experimental evolution, and of historical development. The question of historical development is understood only through the approach of geological history, which must itself be interpreted through an understanding of the geological record. An understanding of the meaning of time involves, first, the interpretation of local sequences of strata, and second, fitting together those fragments of the geological record scattered over the whole world which together represent the time sequence as we know it. The paleontological record is read from this volume. 1. Change. 2. Not repeat. 3. Definite direction. 4. Apparent overlap or connection of members of the sequence. One of the most important features in the story of man is that the earlier chapters are read from the geological record and not from documents of entirely recent or historical origin.

Does the point of origin indicate derivation of man from an ancestral non-human type? Yes. Man appears at the right time and with the physical characters that we would expect if he were derived from a non-human type by modification. What is creation? Making of something new out of pre-existing materials. Does man's history show changes in physical types? Yes. Advance in brain type? Yes. Will the future probably bring new and more advanced types of man? Yes, unless the myriad centuries of evolution of the organic world have led to halting of evolution only when an organism becomes intelligent. Intelligence should lead us to choose the best path of evolution and we believe it will. (*Author's abstract.*)

The next speaker, Dr. ADOLF SCHULTZ, spoke on *The embryological evidence of the evolution of man.* His address, under that title, is published in full in This JOURNAL, vol. 15, June 19, 1925.

The concluding speaker was Dr. ALEŠ HRDLIČKA of the U. S. National Museum, who spoke on anthropological explorations in connection with the problem of evolution.

The addresses were illustrated with lantern slides.

196th MEETING

The 196th meeting was held jointly with the Geological Society of Washington in the assembly hall of the Cosmos Club on the evening of Wednesday, January 28th. Professor FREDERICK J. PACK of the University of Utah spoke on *Some scenic aspects of Utah geology.*

Dr. HUGH D. MISER of the U. S. Geological Survey spoke on *Erosion in the San Juan Canyon, Utah.*

The canyon of San Juan River extends west across a high arid region in southeastern Utah and joins the Glen Canyon of Colorado River near the southern boundary of the state. It reveals a magnificent geologic structure. There is section possession of the same dimensions as the canyon, as much as

half a mile high and 133 miles long. The rocks aggregate a thickness of 5,000 feet and consist of limestone, sandstone, and shale, ranging in age from Pennsylvania to Jurassic. Most of the rocks are red beds, and, since soil is scanty and rock ledges abound, red is the predominating color in any landscape view. The rock strata have been flexed into a broad gentle arch, but neither the arch nor the minor structural features, such as anticlines, synclines, monoclines, faults, and joints, have influenced the course of the river. The present crooked course of the river in the canyon is a striking example of an entrenched meandering stream. Such a course may have been developed on a former cover of Tertiary sediments or on a peneplain, fragments of which stand near and above the walls. The peneplain is possibly of Pleistocene age, and the canyon cutting therefore apparently began in Pleistocene time. The cutting was rapid but did not continue uniformly as there were a few short pauses when the river was graded and deposited gravel which now floors benches of small area on the walls. Rock debris, consisting of sand, gravel, and boulders, forms the bed of the river and attains a depth of perhaps 100 feet or more. But it is presumably absent in a few of the rapids that are produced by inclined ledges of hard rock which cross the channel. Long stretches of the canyon, where the debris is deepest, present the peculiar example of an alluvial stream flowing between close walls of solid rock, but much of the debris is apparently moved by high floods that take place many years apart.

The San Juan River carries an unusually large quantity of debris for streams in the United States and it is one of the chief contributors of mud to Colorado River. The water is always muddy, but during flood stages the river is actually a river of mud; and according to samples taken by Pierce it occasionally carries by volume three times as much silt as water. The heavy load of debris carried during floods causes a peculiar kind of waves known as sand waves. These waves attain a height of about 7 feet and resemble those thrown up by a stern-wheel river steamboat. They travel upstream, in marked contrast to other kinds of waves that are stationary and also to waves that travel downstream.

If the proposed storage and power projects on San Juan and Colorado rivers are carried to completion the river, on reaching the heads of the reservoirs, will change its work from erosion to deposition. An important question concerning the reservoirs is, How soon will they be filled with rock debris? The answer to this question remains for the future, because the data available at present are not sufficient for making an estimate of the total lead of debris that is carried each year by the San Juan and discharged into the Colorado. (*Author's abstract.*)

Both papers were illustrated with colored lantern slides.

197th MEETING

The 197th meeting was held jointly with the affiliated biological societies of Washington in the assembly hall of the Cosmos Club on the evening of February 19, 1925. A group of papers was presented on the general subject of *Undesirable Immigrants*. Dr. J. R. MOLLER treated the subject from the standpoint of *Animal Diseases*, under the title *Foreign Insects a Menace*.

It is to the interest of this country to prevent the introduction of contagious diseases, whether of humans, of other animals, or of plants. Within the past year there have been two examples of the great economic loss which may result

from the inroads of foreign pests and of the danger to some of our greatest industries. The outbreak of foot-and-mouth disease among the livestock of California and Texas, was the concern of the entire country and Congress acted promptly in appropriating money to combat it. This plague of livestock is so contagious that the United States Department of Agriculture takes every precaution against introduction, even to prohibiting experimental work with the disease in this country.

In spite of all precautions the virus of a dangerous disease sometimes gets by the barriers maintained by the Bureau of Animal Industry. The exact method by which the recent foot-and-mouth disease gained entrance is not known. The introduction of virus of the European fowl pest, which appeared in poultry flocks of this country last December, is of peculiar interest, because of the probable method of its introduction. This disease had not been known in the United States and precautions were taken against its introduction, but it has been found that an investigator working on filterable viruses in a large eastern institution obtained the virus of the European fowl pest, in the summer of 1923, from the Pasteur Institute of France. Dr. JOHN R. MOHLER, Chief of the Bureau of Animal Industry, says there is a possibility that the disease was introduced through some other channel, but that this is the only known source of this virus, and that the disease was first found in States where work with the virus was done. The Department of Agriculture does not permit the importation of animals from countries having destructive animal diseases not already present here. It is very rarely that a dangerous disease gets past the barriers that have been raised to exclude livestock diseases. There have been several outbreaks of foot-and-mouth disease in the past 40 years which have been stamped out by the bureau veterinarians. There have been a few outbreaks of other animal diseases foreign to this country, including the present outbreak of the European fowl pest. Only those well acquainted with disease conditions throughout the world know what we have probably escaped by maintaining quarantine walls and by sending inspectors into foreign countries. (*Abridged from author's abstract.*)

Dr. THOMAS E. SNYDER of the Bureau of Entomology treated the subject from the standpoint of plant diseases and insect pests, under the title *Forest insect pests and their control.*

Col. GREELEY has referred to the great destruction of forest trees by barkbeetles and defoliating insects and emphasized the importance of forest management in their control. There are other types of forest insects which cause an annual loss of forest products estimated at $40,000,000. To this loss must be added percentages of the cost and upkeep of lumber camps, machinery, equipment, logging railroads, wages and keep of men and animals in the woods, storage in the mill pond, sawing, drying, finishing and piling at the mill. Where the products, such as telephone poles, construction timbers, etc., are damaged after being put in place, the cost of replacement involves losses of labor and time, as well as the cost of the original and replaced products. The control of these insects is an important factor in forest conservation. The losses they cause can be greatly lessened by slight readjustments in logging operations, mill management, closer utilization and the use of wood preservatives. (*Author's abstract.*)

Dr. LAWRENCE KOLB of the Hygienic Laboratory treated the subject from the standpoint of *Human diseases.*

The addresses were illustrated by lantern slides and moving pictures.

WALTER D. LAMBERT, *Recording Secretary.*